

stant composition of the substance evolved. Thus, when fused protiodide of tin is decomposed by the voltaic current (539), the conclusion may be drawn that both the iodine and tin are *ions*, and that the proportions in which they combine in the fused compound express their electro-chemical equivalents. Again, with respect to the fused iodide of potassium (540), it is an electrolyte; and the chemical equivalents will also be the electro-chemical equivalents.

576. If proposition viii. sustain extensive experimental investigation, then it will not only help to confirm the results obtained by the use of the other propositions, but will give abundant original information of its own.

577. In many instances, the *secondary results* obtained by the action of the evolved *ion* on the substances present in the surrounding liquid or solution will give the electro-chemical equivalent. Thus, in the solution of acetate of lead, and, as far as I have gone, in other proto-salts subjected to the reducing action of the nascent hydrogen at the *cathode*, the metal precipitated has been in the same quantity as if it had been a primary product (provided no free hydrogen escaped there), and therefore gave accurately the number representing its electro-chemical equivalent.

578. Upon this principle it is that secondary results may occasionally be used as measurers of the volta-electric current (441, 475); but there are not many metallic solutions that answer this purpose well: for unless the metal is easily precipitated, hydrogen will be evolved at the *cathode* and vitiate the result. If a soluble peroxide is formed at the *anode*, or if the precipitated metal crystallise across the solution and touch the positive electrode, similar vitiated results are obtained. I expect to find in some salts, as the acetates of mercury and zinc, solutions favourable for this use.

579. After the first experimental investigations to establish the definite chemical action of electricity, I have not hesitated to apply the more strict results of chemical analysis to correct the numbers obtained as electrolytic results. This, it is evident, may be done in a great number of cases without using too much liberty towards the due severity of scientific research. The series of numbers representing electro-chemical equivalents

must, like those expressing the ordinary
equivalents of chemi-
cally acting bodies, remain subject to
the continual correction
of experiment and sound reasoning.
580. I give the following brief table
of *ions* and their electro-